

JSC scores a slam dunk

The NBA All-Star Jam Session, held at the George R. Brown Convention Center, was part of the NBA All-Star Game festivities. JSC's exciting exhibit featured an astronaut suit photo-op, the Exploration Dome, astronaut autographs, a Robonaut model and the inflatable astronaut.



Space Center Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Johnson Space Center, Houston, Texas, and is published by the Public Affairs Office for all Space Center employees. The Roundup office is in Bldg. 2, Rm. 166A. The mail code is AP121. Visit our Web site at: <http://www.jsc.nasa.gov/roundup/online/> For distribution questions or to suggest a story idea, please call 281/244-6397 or send an e-mail to roundup@ems.jsc.nasa.gov.

Joanne Hale Editor
Kendra Phipps Assistant Editor
Catherine Borsché and Brad Thomas Staff Writers
Marshall Mellard Graphic Designer

**PRSR STD
U.S. POSTAGE
PAID
WEBSTER, TX
Permit No. 39**



Lyndon B. Johnson Space Center
SPACE CENTER ROUNDUP
Volume 45 • Number 3
MARCH 2006

Roundup



Commit to be fit with the JSC Exploration Wellness Program! JSC employees work their way to a healthier future using the brand-new fitness facility located inside the recently renovated Gilruth Center.

NASA/Blair JSC2006E02290

Starport fitness

FROM THE director

A MESSAGE FROM CENTER DIRECTOR MICHAEL L. COATS



The Joint Leadership Team

Many of you are not yet familiar with the JSC Joint Leadership Team (JLT). I hope to change that impression and introduce you to the work of this dedicated team.

The JLT was started by General Jefferson D. Howell Jr. in response to the concerns you expressed following the Safety and Mission Success survey taken in 2003. The team is made up of senior leaders from JSC and all of our major contractors and subcontractors. Our initial charter was to foster an environment with a strong focus on mission safety.

Much has changed since the JLT was first formed. Today, our mission is broader than launching the shuttle, operating the space station or developing our next human space vehicle. Our shared mission is to push the boundaries of human knowledge and encourage future generations to do the same. We must understand how this transition affects us, and how we position ourselves for an exciting future. We can accomplish our mission only by working together as members of a single team—the space team.

We must support the continued safe operation of the programs while at the same time charting a course of future exploration. We must also create an environment that encourages you, who invest so much in the space program, to express your opinions, feel challenged and rewarded in your work, and have time to enjoy your families.

I have talked before about the importance of family, but it bears repeating. There is great reward in the work we do for America's space program, but the reward is much greater when balanced with a strong home and family life.

We don't have all the answers, and we may not even know all the questions to ask. You can help by becoming involved. Our success relies on all of us working together, asking questions, having our voices heard and communicating with each other in an environment of respect, honesty and openness.

The JLT—working together to build our future.

Joint Leadership Team retreat

“Over the years, I've found that most issues confronting an organization can successfully be resolved through good leadership and honest, two-way communication. Our Joint Leadership Team (JLT) provides an outstanding forum for improving communications with our contractor/civil service team and for assisting our leadership in tackling the challenging issues that face JSC. We had some great discussions that generated specific actions to continue to improve our work environment at JSC for everyone.”

Bob Cabana, JSC deputy director

*“In the two years since the JLT was formed, **amazing progress has been made** in establishing a true team among the JSC civil service and contractor managers. This team, with its ability to identify tough issues, engage in frank discussions, and openly address areas of concern, is well positioned to help JSC achieve its vision of being the leader for human space exploration.”*

Sandy Johnson, president, Barrios Technology

*“We concluded as a team that most of the challenges we face can be met with strong leadership and better communications at all levels. **It was energizing to see** Mike focusing his civil servant/contractor team on meeting those challenges. The working relationship between Mike's direct reports and the contractor senior leadership at JSC is the best that I have experienced in my long career here, and I look forward to helping drive that type of relationship to all levels of the JSC team.”*

Tom Sanzone, general manager, Hamilton Sundstrand Space, Land & Sea—Houston



The JSC Joint Leadership Team, which is made up of senior management from NASA and contractor partners, met to develop plans based on the analysis of a recent survey taken by employees on the work environment at JSC.



“If I were not a physicist, I would probably be a musician. I often think in music. I live my daydreams in music. I see my life in terms of music.”

Albert Einstein

MUSIC A WELCOME GUEST ON SPACE MISSIONS

Celestial sounds

by Kendra Phipps



“When we hear different pieces of music, it triggers memories and moods,” said Walt Sipes, chief of operational psychology at Johnson Space Center. Sipes and his team provide psychological support to International Space Station astronauts, helping them feel more at home and handle stress during long-duration missions.

“We do a full-court press, and music is one part of it,” he said. The group keeps crews informed and entertained by electronically sending up newspapers, movies and favorite songs.

Resting an arm on the window, the passenger gazes through the glass and takes in the passing scenery. Colors blur together as the vehicle cruises along. A song plays quietly on the radio.

Free from the responsibility of steering and braking, she closes her eyes and lets the song clear her mind. She thinks back to when she first heard it in college—or was it high school? Old friends come to mind, jokes she’d forgotten they’d shared, places she’d forgotten she’d been.

Music is driving and, for the moment, she’s just along for the ride.

A few songs later, she opens her eyes, smiles and floats over to turn the music off. She’s got a long checklist to complete before tomorrow’s spacewalk.

Music is the best part of any journey, whether it’s a road trip or a trip down memory lane. So it’s only fitting that music come along with astronauts on the ultimate journey into space.

Music may be just one tool in Sipes’ kit, but it’s an important one. Unlike some other forms of entertainment, music has no visual element, leaving the mind free to picture what it will and go where it wants. An astronaut could enjoy an opera while checking out the spectacular view out the window, or let an old favorite rock song mentally take him back to his air-guitar glory days.

As many Earth-bound exercisers know, music can also be a great motivator to get moving in the morning.

“The place I listened the most was in the node on the resistive exercise device while I was working out,” said Expedition 11 Science Officer and Flight Engineer John Phillips. “It was very nice to have.”

Sipes agreed that music can help with exercise. “When you think of ‘Rocky’ and

hear that music—he’s out there pounding the pavement every morning, so naturally people listen to that to exercise,” he said.

Since it’s hard to purchase a favorite movie soundtrack from 220 miles above Earth, Sipes and his team burn music onto discs for crewmembers before each mission, taking into account the astronaut’s personal preferences and tastes. Additional files can be sent electronically during the mission. Expedition 12 even got a special live performance when part of a Paul McCartney concert was linked up to the station in November 2005.

MAKING COSMIC MUSIC

However they receive it, music can be a welcome piece of home for astronauts. But creating music can be just as fun as listening to it.

Several astronauts have brought musical instruments to the space station. Expedition 4 Flight Engineer Carl Walz brought a keyboard with him, which has been enjoyed by several station crews—it even provided the wedding music for Expedition 7 Commander Yuri Malenchenko’s long-distance nuptials. Expedition 3 Commander Frank Culbertson practiced his trumpet onboard, and a guitar has been played by several astronauts. At one point, an Australian aboriginal wind instrument called a didgeridoo was onboard.

Since space station missions last around six months, crewmembers have some free time to explore interests such as music.



Astronaut Edward T. Lu, Expedition 7 NASA ISS science officer and flight engineer, plays a musical keyboard during off-shift time in the Destiny laboratory on the International Space Station.



Astronaut Carl E. Walz (lower left), Expedition 4 flight engineer, plays host to some crewmates as he performs on a musical keyboard in the Destiny laboratory on the International Space Station. From the top, clockwise, are astronauts Rex J. Walheim, Jerry L. Ross, Ellen Ochoa, Lee M. E. Morin, all STS-110 mission specialists, and Stephen N. Frick, STS-110 pilot; along with astronaut Daniel W. Bursch (right foreground), Expedition 4 flight engineer.

“Music, like other forms of recreation, is an essential part of the crew’s well-being,” said Flight Director Cathy Koerner. She said that a space station crew usually has a few hours per day set aside “to eat meals and prepare for, or unwind from, their day,” along with weekends and holidays.

Space shuttle crews are in space for a much shorter time, so they have less free time to spare; however, shuttle crews have a built-in daily dose of music in the form of wake-up songs.

“Wake-up music for shuttle missions is generally selected by the crew office,” said Koerner. “Most of the songs are selected for or by individual crewmembers and represent something of significance to them.” She added that crew families are sometimes allowed to submit songs for their loved ones to wake up with.

Some shuttle astronauts have also played instruments in orbit. *Challenger* astronaut Ronald McNair took a soprano saxophone on his first flight, STS-41B, and found time to play a medley of songs. Astronaut Ellen Ochoa, a classical musician, brought her flute as a personal item on STS-56.

MUSICAL PRANKSTERS

But the honor of being the first space musicians goes to Gemini 6 astronauts Wally Schirra and Thomas Stafford. On Dec. 16, 1965, the two caused a stir in Mission Control with a report of an “object” near their spacecraft. Heart rates on the ground may have been racing until a familiar song came over the wire: Schirra was playing “Jingle Bells” on the harmonica, backed up by Stafford on the sleigh bells. The reported UFO must have been Santa Claus, making an early practice run before Christmas Eve. The first instruments played in space are now in the Smithsonian National Air and Space Museum.

Stafford told *Smithsonian* magazine that the musical prank was Schirra’s idea.

“He could play the harmonica, and we practiced two or three times before we took off, but of course we didn’t tell the guys on the ground,” said Stafford. “We never considered singing, since I couldn’t carry a tune in a bushel basket.”

From pocket harmonicas in a Gemini capsule to an electronic keyboard on the space station, music in space has come a long way. But it only makes sense that something as human as this art form would play a role in human spaceflight.

“The strangest thing about playing music in space,” Walz once said, “is that it’s not strange. In most homes, there’s a musical instrument or two. And I think it’s fitting that in a home in space you have musical instruments as well. It’s natural.”



Starport fitness

by Jenna Mills
Illustrations by John Streeter

BLAST OFF

to a healthy future with the JSC Exploration Wellness Program! The wellness program kicked off the grand reopening festivities at the Gilruth Center in February to unveil improvements made over the last year. Employees came and went throughout the week with opportunities for having blood pressure screenings, receiving chair massages, hearing unique speakers, touring new facilities, signing up for membership and more.

So, what's new? The Gilruth Center is now equipped with a 7,000-square-foot state-of-the-art fitness facility, two group exercise rooms and renovated men's and women's locker rooms. After their midday workout, employees in a hurry can

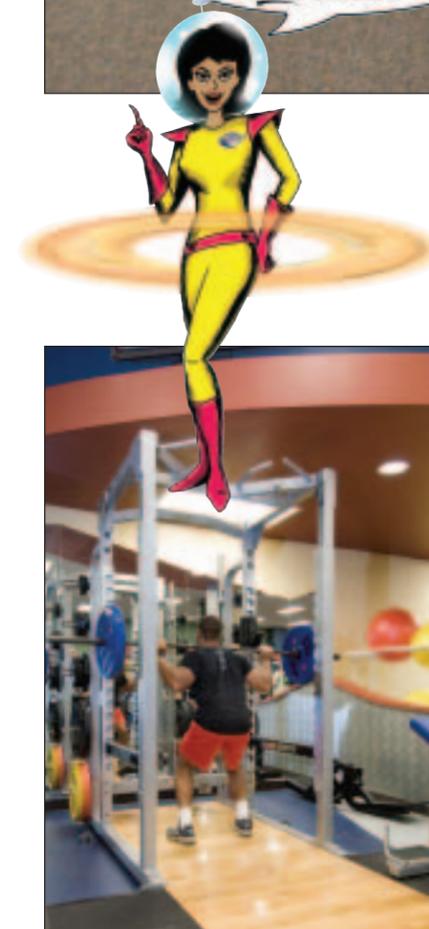
grab ready-made healthy lunches at the Starport Gift Shop now located inside the lobby.

The wellness program is committed to the health and well-being of JSC employees. The remodeled Gilruth Center is just the beginning. In the months to come, new programs will be implemented, and soon all members will be able to log in to the new Exploration Wellness interactive Web site, where they can create their own personal profile and set up a personalized program to fit their needs.

The JSC Exploration Wellness Program is up to the challenge of creating a healthy new you. Are you ready to commit to be fit in 2006?



The new fitness facility prompted many JSC employees and retirees to get moving and become healthier in 2006. Some employees (above) get in a quick workout during their lunch break before heading back to their busy schedules.



Above: Wellness Coordinator and fitness instructor Jennifer Blok leads a group of energized JSC employees during an afternoon step aerobics class.

Left: IT Security Specialist, Bobby Simpson II, works out his legs with another set of squats using the Olympic rack located in the new fitness facility.

A stellar group

THE CREW OF STS-121 GEARS UP FOR ITS FANTASTIC VOYAGE

by Catherine E. Borsché

As the crew feverishly trains for their upcoming mission slated for later this year, one word comes to mind that sums up this elite team: explorers.

Meet the diverse group of astronauts who are going to continue our Return to Flight efforts with this second test flight.

STEVE LINDSEY Commander

Lindsey, a native of California, is no stranger to high-flying adventure.

As a colonel in the U.S. Air Force, Lindsey logged over 5,000 hours of flight time in more than 50 different types of aircraft.

Selected as an astronaut candidate in 1995, he has since flown on three different spaceflight missions: STS-87 (Nov. 19 to Dec. 5, 1997), STS-95 (Oct. 29 to Nov. 7, 1998) and STS-104 (July 12 to 24, 2001).

Lindsey, as commander of STS-121, will be looking to complete all the goals that were not completed during the first Return to Flight mission.

"As a test mission, our primary objectives are going to be to carry out all those test objectives that weren't accomplished on STS-114, to take the lessons learned from STS-114 in terms of Return to Flight tests and apply them to our flight," Lindsey said. "Hopefully, at the end of our mission, we'll have everything done that needs to be done prior to going back into space station assembly on the flight after ours."

Their mission will be an important stepping-stone to getting back to exploration endeavors, which Lindsey feels are invaluable to the space program.

"The reason we're willing to take the risk is because the goal, exploration, is something we think is an inherent part of us," Lindsey said. "What we learn from spaceflight far, far exceeds the risks in my opinion, so it's worth doing."

MARK KELLY Pilot

Kelly, like Lindsey, also has a military background. A commander in the U.S. Navy, Kelly has logged over 4,000 flight hours in more than 50 different aircraft and has over 375 carrier landings. He was also a member of Attack Squadron 115, based in Atsugi, Japan. While assigned to Attack Squadron 115, Kelly deployed twice to the Persian Gulf aboard the *USS Midway*. During his second deployment he flew 39 combat missions in Operation Desert Storm.

Kelly was selected as an astronaut in 1996. Having completed two years of training and evaluation, he is qualified for flight assignment as a pilot. He flew on STS-108 in 2001 and has logged almost 12 days in space.

With the astronauts' heavy training schedule, a lot of personal sacrifice is

required to make this flight a success. But with sacrifice comes reward.

"It's a big, very exciting adventure to get to make a trip into orbit. You look at it as a privilege," Kelly said. "So you really decide that you're going to put the time in and work really hard to get to the point where you're ready."



Astronaut Steven W. Lindsey, STS-121 commander, occupies the commander's station during a mission training session in one of the high-fidelity trainers in the Space Vehicle Mockup Facility at JSC.



Astronaut Mark Kelly prepares for training at the Neutral Buoyancy Laboratory.

MIKE FOSSUM Mission Specialist

As a former U.S. Air Force test pilot, Fossam had a unique vantage point of the world. STS-121 will allow him to join the elite group of astronauts that has been able to look at the "blue marble" of Earth from space.

Fossam resigned from military active duty in 1992 to work for NASA, and is currently a colonel in the U.S. Air Force Reserves. He has logged over 1,000 hours in 34 different aircraft.

Fossam was selected as an astronaut in 1998 and has served in various positions at NASA, including as the Astronaut Office lead for space station flight software development. He supported several flights as a Capsule Communicator (CAPCOM) in Mission Control, including acting as lead CAPCOM for Expedition 6.

It takes a huge amount of teamwork to make a mission complete, and Fossam values the contributions made by his fellow astronauts and teammates in the trenches.

"There's nothing I like more than to walk into a shop, without a crowd of people, and really talk to the people that are doing the work," Fossam said. "Because, you know, this is not just a crew of seven that makes a shuttle fly. There are thousands of people that are lifting her up into the air on their shoulders, and I know that."

LISA NOWAK Mission Specialist

Nowak, a commander in the U.S. Navy, has had some pretty amazing experiences before joining NASA.

Nowak has flown aircraft in small- and large-scale exercises with jamming and missile profiles for the Electronic Warfare Aggressor Squadron 34 at Point Mugu, Calif. In 1993, she was selected for both Aerospace Engineering Duty and U.S. Naval Test Pilot School. Nowak was assigned to Naval Air Systems Command, working on acquisition of new systems for naval aircraft, when she was selected for the astronaut program.

Selected as an astronaut in 1996, Nowak is now qualified as a mission specialist. Most recently, she served in the Astronaut Office Robotics Branch and in the CAPCOM

Branch, working in Mission Control as prime communicator with on-orbit crews.

STS-121 will be Nowak's first spaceflight, and she is excited at the prospect.

"Probably the best part in the big picture is knowing that I am contributing to our space effort," Nowak said. "From a personal point of view, I've just heard how wonderful the view is from up there. You can look at a picture and that's one thing, but everybody's told me that when you experience it yourself it's something that you feel; it's not something that you see. And I'm really looking forward to that."

STEPHANIE WILSON Mission Specialist

Wilson's unique background in space research will be invaluable for this mission.

While working at Martin Marietta Astronautics Group in Denver, Colo., she was responsible for performing coupled loads analyses for the launch vehicle and payloads during flight events. Later on, while attending graduate school at the University of Texas, her research focused on the control and modeling of large, flexible space structures. In 1992, Wilson went to the Jet Propulsion Laboratory in Pasadena, Calif., to work with the Attitude and Articulation Control Subsystem for the Galileo spacecraft. While there, she was a member of the Integrated Model Team, which was responsible for finite element modeling, controller design and software development.

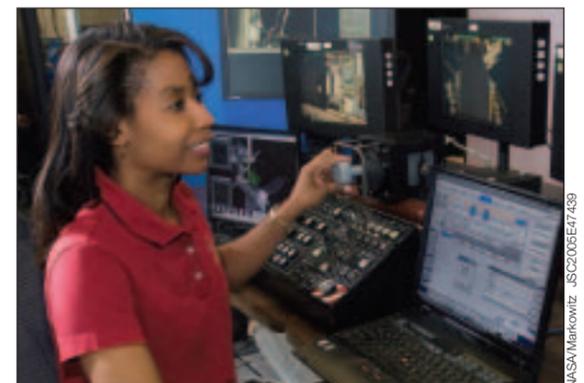
Wilson reported to Johnson Space Center in 1996 and became trained as a mission specialist. She's worked in both the Station and Shuttle Operations Branch in the Astronaut Office and has been a CAPCOM in Mission Control.



Astronaut Michael E. Fossum, STS-121 mission specialist, uses a climbing apparatus to lower himself from a simulated troubled shuttle in an emergency egress training session in the Space Vehicle Mockup Facility at JSC.



Astronauts Lisa M. Nowak (foreground) and Stephanie D. Wilson, STS-121 mission specialists, participate in a training session in the virtual reality lab at JSC.



Astronaut Stephanie D. Wilson, STS-121 mission specialist, participates in a simulation exercise using the Space Station Remote Manipulator System simulator in the Avionics Systems Laboratory at JSC.

continued on page 10

Stardust comet sample return amazes scientists

by Bill Jeffs

The world's first-ever cometary and interstellar dust particles captured by a spacecraft and returned to Earth have joined NASA's collection of astromaterials that includes lunar samples, solar wind atoms and meteorites.

NASA's Stardust capsule returned to Earth Jan. 15 at the Utah Test and Training Range. The capsule re-entered at nearly 29,000 mph—the highest velocity of any human-made object entering the Earth's atmosphere. The Stardust Sample Return Canister was flown to Ellington Field Jan. 17. Later that day, it was transported to the Stardust curatorial facility at the Johnson Space Center and opened to give scientists their first glimpse inside.

"The collection of cometary particles exceeded our expectations," said Donald Brownlee, Stardust principal investigator, University of Washington. "We were excited that the mission had gone well. The comet had to cooperate in providing the particles, and they had to be captured. We were absolutely thrilled to see many large impacts on the Aerogel."

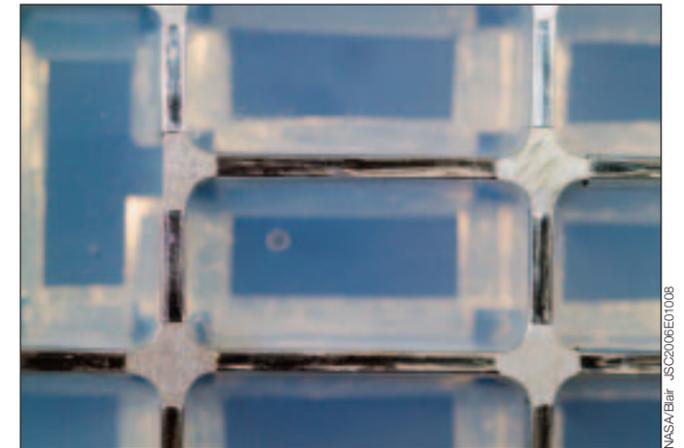
Inside the canister, a tennis racket-like sample collector tray holds the particles captured in silica aerogel as the spacecraft flew within 149 miles of comet Wild 2 in January 2004. An opposite side of the tray holds interstellar dust particles caught streaming through the solar system by Stardust during its seven-year, 3-billion-mile journey.

Scientists believe these cometary particles are the pristine remains of the material that formed the planets some 4.6 billion years ago. Comets are believed to be the well-preserved remnants of the primitive bodies at the formation of the solar system, possibly composed of some of the basic building blocks of life. In their investigations of the returned samples, scientists expect to find evidence that comets may have brought water to the Earth, making life possible.

"Now, we can bring to the people of Earth a unique glimpse of the beginning of our solar system," said Peter Tsou, Stardust deputy principal investigator, Jet Propulsion Lab. "Tiny samples from a distant comet can open giant windows to our past."

Much of Stardust's success depended upon Tsou's proposal to use Aerogel, the world's lowest density solid, to trap the planetary particles streaming through space faster than a rifle bullet. Blocks of the smoky looking foam filled the aluminum tray assembly that was extended from the Stardust spacecraft during the collection phases of the mission.

"I had warned the team we might not be able to see tracks with the naked eye and not to be disappointed," Brownlee said.



Closeup view of cometary impact (center) into Aerogel which was inspected by scientists at a laboratory at JSC hours after the Stardust Sample Return Canister was delivered to the space center from the spacecraft's landing site in Utah.



Mike Zolensky (left), Stardust curator and co-investigator, and Donald Brownlee, principal investigator with the University of Washington, study Stardust material after its canister is opened in a laboratory at JSC.

Scientists were elated to see numerous easy-to-see tracks, including at least one large enough to poke a little finger in. They were thrilled to see tracks with the unaided eye while standing a few feet away from the collector.

Wilson knows that this shuttle mission and the ones that follow will play a large role in preparing NASA for the future.

"I believe the role of STS-121, as with the subsequent shuttle missions, will be to complete our phase of low-Earth orbit," Wilson said. "We will not be going to the moon or Mars during this phase, but we certainly have learned a great deal about re-engineering and redesigning our systems, about upgrading our processes for developing or maintaining our vehicles here on the ground and interfacing with Mission Control."

PIERS SELLERS Mission Specialist

Sellers is probably the most well-traveled member of the STS-121 crew.

Before joining the astronaut corps, Sellers researched how the Earth's biosphere and atmosphere interact. His work involved computer modeling of the climate system, satellite remote-sensing studies and field work using aircraft, satellites and ground teams in places such as Kansas, Russia, Africa, Canada and Brazil.

Sellers was selected to be an astronaut in 1996. Initially, he was assigned technical duties in the Astronaut Office Computer Support Branch, followed by service in the Astronaut Office Space Station Branch. During this time, he also worked part-time in Moscow as a technical liaison on International Space Station computer software.

Sellers is a veteran of one spaceflight, STS-112. During that mission, he logged over 252 hours in space, including almost 20 spacewalk hours in three spacewalks.

Sellers received much of his inspiration to be an astronaut from the earlier astronauts.

"I watched all that stuff on TV when I was a kid, all the lunar landings, Skylab, early shuttle," Sellers said. And of those powerful images locked in his memory, he finds them simply "mesmerizing."

THOMAS REITER Mission Specialist

Reiter will be going up with STS-121, but he's getting a different ticket punched for the ride home.

Reiter will join Expedition 13 under a commercial agreement between the European Space Agency (ESA) and Roscosmos. When he arrives at the station, the crew will be made up of three people for the first time since May 2003.

Reiter, who flew for six months on the Russian space station Mir, will be the first non-American or non-Russian long-duration crewmember on the station. He will return to Earth aboard either shuttle mission STS-116 or a Russian Soyuz.

A native of Germany, Reiter has been very active within ESA since 1992. In 1995, he was assigned as onboard engineer for the Euromir 95 mission and spent a record-breaking 179 days in space, completing two spacewalks.

Between October 1996 and July 1997, Reiter underwent training on Soyuz-TM spacecraft operations for de-docking, atmospheric

reentry and landing. He was awarded the Russian "Soyuz Return Commander" certificate, which qualifies him to command a three-person Soyuz capsule during its return from space. Later, he

participated in an International Space Station advanced training class to prepare for the first European long-term flight aboard the station.



Astronaut Piers J. Sellers, STS-121 mission specialist, attired in a training version of the Extravehicular Mobility Unit space suit, is about to begin a training session in the Neutral Buoyancy Laboratory near the JSC.



European Space Agency (ESA) astronaut Thomas Reiter (left) of Germany, astronauts Piers J. Sellers and Stephanie D. Wilson, both STS-121 mission specialists, participate in a training session in one of the full-scale trainers in the Space Vehicle Mockup Facility at the JSC.

"The reason we're willing to take the risk is because the goal, exploration, is something we think is an inherent part of us."

Steve Lindsey, STS-121 Commander